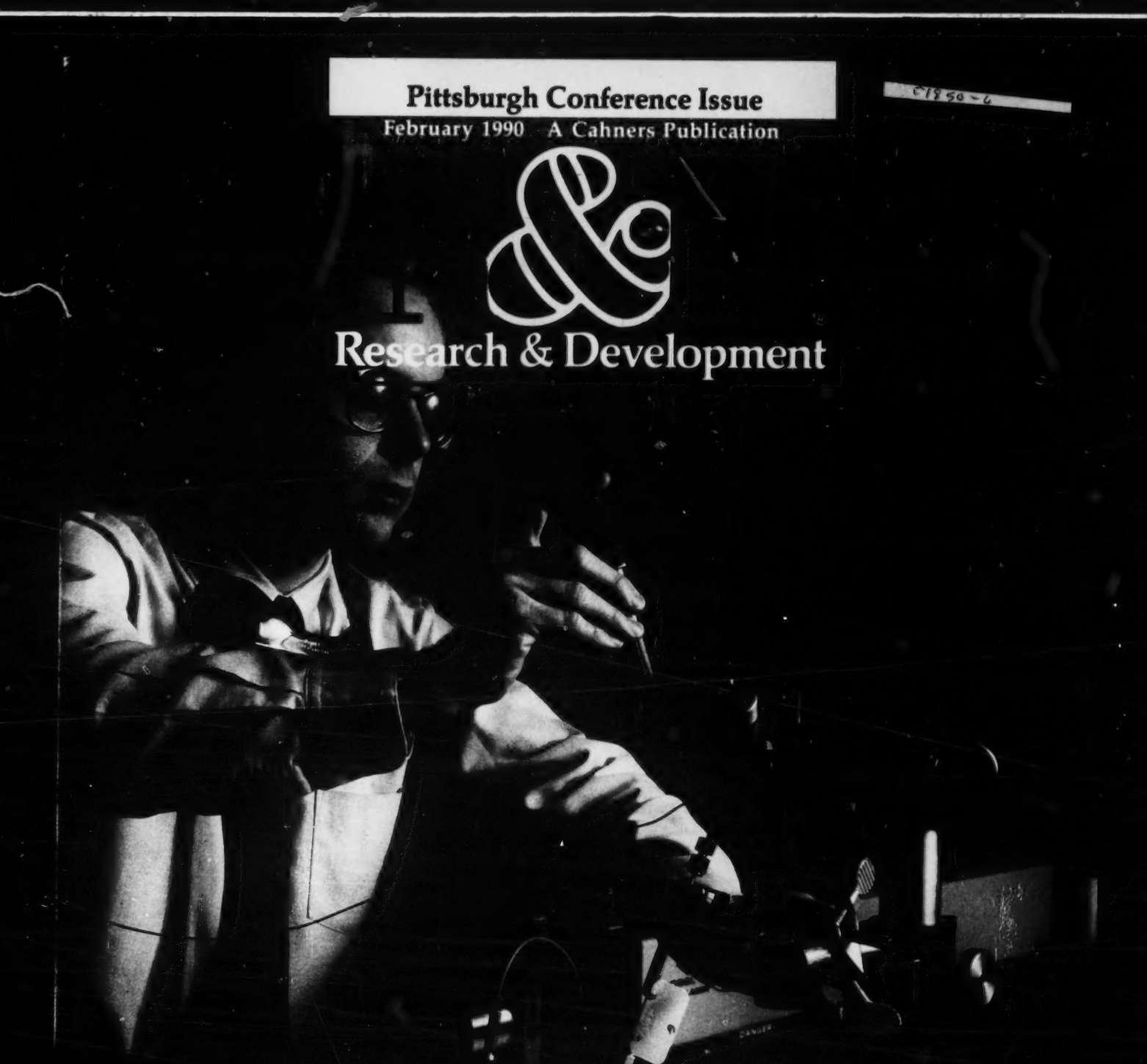
Pittsburgh Conference Issue
February 1990 A Cahners Publication

CB50-2

Research & Development



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INTERNATIONAL MAGAZINE OF RESEARCH AND DEVELOPMENT

R&D

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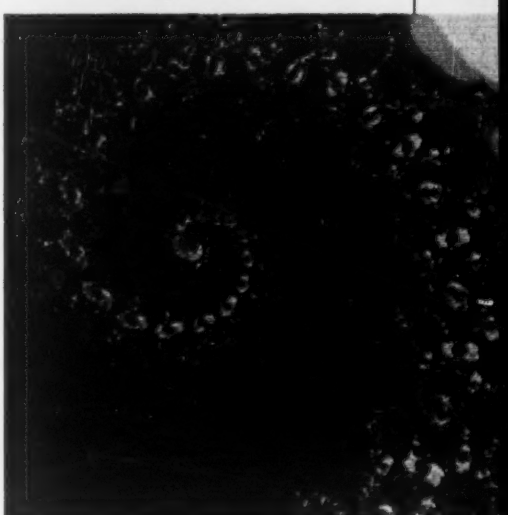

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ON THE COVER

This laser-based indirect thermal lens spectroscopy detection system, shown with developer Donald Bobbitt from Univ. of Arkansas, reveals transparent molecules without using dyes or derivatives. Article on page 94. *Photo by Wendy Robertson.*

READER SURVEY

Please tell us what you like and don't like about your profession by filling out the Career Satisfaction Survey on page 173. Look for the results in an upcoming issue.

Electrical and Electronic Instrument Markets Strong

Latest *R&D Magazine* Trendsurvey of use and intention to buy shows steady demand for 31 types of research tools.

*By **Robert R. Jones**, Executive Editor, R&D Magazine*

THE MARKET for electrical and electronic instruments remains strong. There is good reason to believe that more than half of the workers in research, development, and quality assurance plan to purchase one or more instruments within the next 12 months.

In addition, it is a market that has not changed greatly during the 80s. This conclusion comes from a recent Trendsurvey of 291 *R&D Magazine* readers.

When those readers were asked whether they planned to purchase one or more of a list of electrical or electronic instruments within the next 12 months, 55.7% replied that they did.

Instruments now used

As to the types of instruments they now use, the 10 types listed most frequently, in descending order, were printer-plotters, digital multimeters, digital voltmeters, dc power supplies, analog oscilloscopes, time and frequency counters, standards calibration instruments, frequency generators, digital electronic thermometers, and multichannel oscilloscopes.

In the three preceding Trendsurveys of electrical and electronic instrument use, published in *R&D Magazine* issues of April 1988, November 1984, and November 1983, printer-plotters also held the top position in terms of most-frequently-listed instrument types.

Of the 10 instrument types most-often listed in the current survey as used by workers in research, development, and quality assurance, six appeared in the top 10 of all four studies: printer-plotters, digital voltmeters, dc power supplies, time and frequency counters, frequency generators, and digital electronic thermometers.

Two of this year's top 10, multichannel oscilloscopes and digital multimeters, were in three of the four top 10s.

The remaining two in this year's top 10, analog oscilloscopes and standards calibrations instruments, were new in the survey questions this year, replacing microprocessors and general purpose oscilloscopes which had appeared in the top 10 of the three previous studies.

It was felt that these products, microprocessors and general-purpose oscilloscopes, are so widely used and generally accepted that their markets were well established and clearly defined. Further analysis of the markets for these two did not appear to be needed at this time.

Instruments to acquire

When readers were asked what types of instruments they plan to acquire within the next 12 months, the 10 most-frequently listed were, in descending order, digital storage oscilloscopes, printer-plotters, analog-to-digital converters, line conditioners with uninterruptible power supplies, dc power supplies, digital voltmeters, microprocessor development systems, standards calibration instruments, digital multimeters, and IEEE-488 buses.

Of the 10, five have been on the most-wanted list of *R&D Magazine* readers in the three preceding studies and also in this one: printer-plotters, line conditioners with uninterruptible power supplies, dc power supplies, digital multimeters, and IEEE-488 buses.

Two others of this year's top 10, digital voltmeters and microprocessor development systems, have been in the top 10 in three of the past four studies.

Two of the top 10, analog to digital converters and standards calibration instruments are new to the study this year.

As was mentioned, digital storage oscilloscopes (DSO) head the list of the 10 most-wanted instrument types this year. This is the first year for DSOs to appear in the top 10, but perhaps its appearance there should not come as a total surprise.

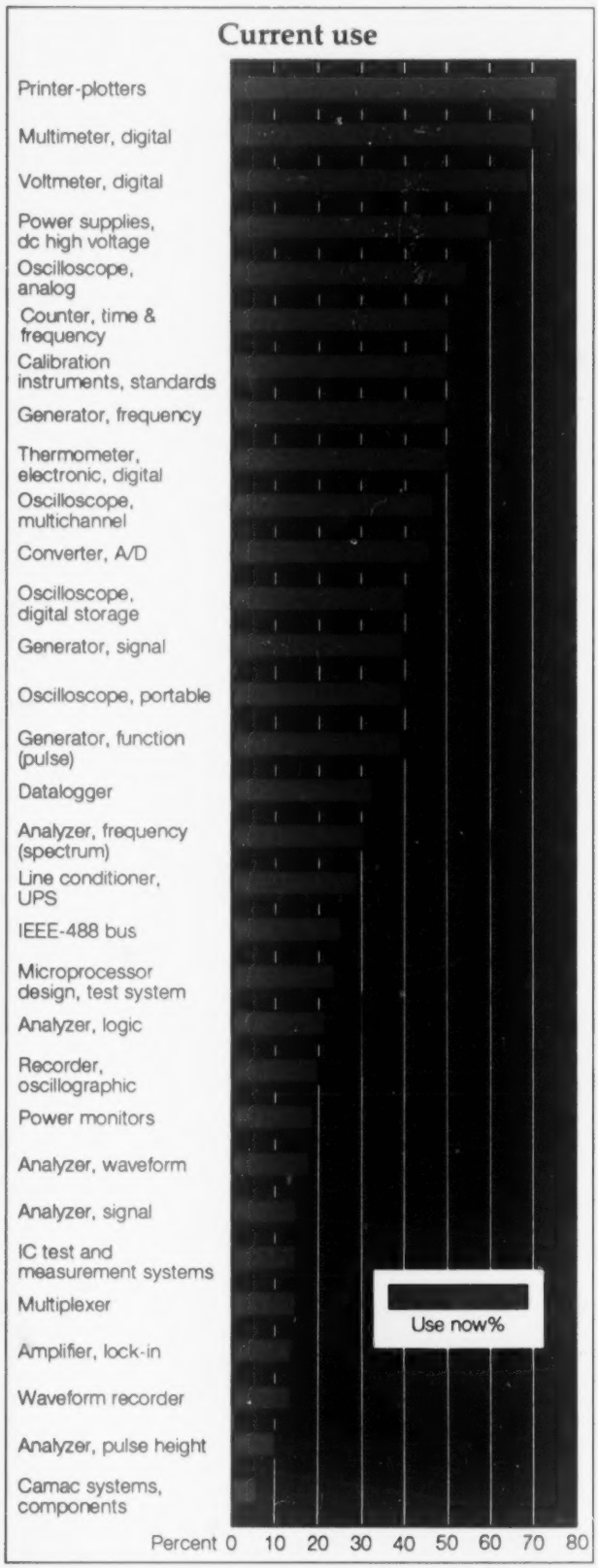
The DSO growth rate (this term is defined below) has risen from an eleventh ranking in 1984 to fifth in 1988 and is third-high now.

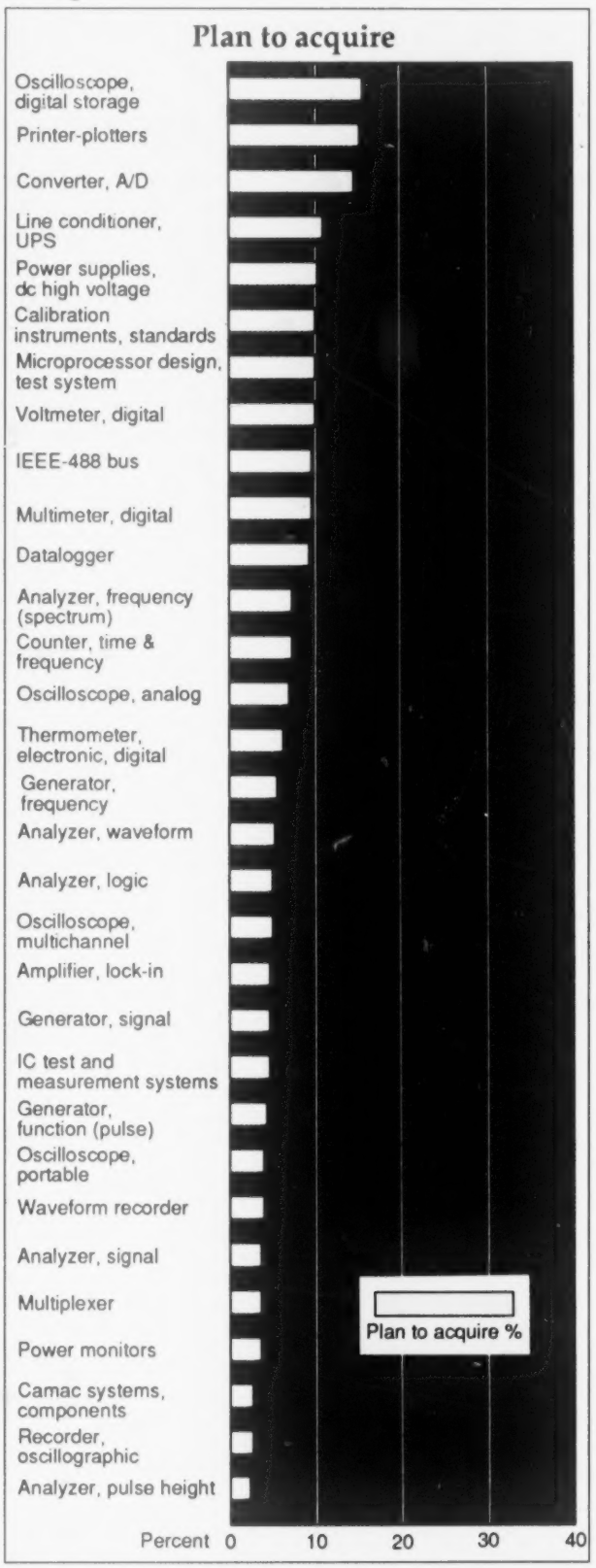
Growth rate

With the Trendsurvey's *use now* and *plan to acquire* data, it is possible to establish a growth rate for the use of each instrument type.

This gives an insight into the data that is not revealed otherwise. For example, multichannel oscilloscopes rank tenth in the list of most-used instrument types at 47.8%. However, they score only 5.2% in plan to acquire, far below the IEEE-488 bus which, at 9.6%, is the lowest-ranked instrument in the top 10 of plan to acquire,

To derive the growth rate of each instrument type, the number of re-


Current use
Printer-plotters
Multimeter, digital
Voltmeter, digital
Power supplies, dc high voltage
Oscilloscope, analog
Counter, time & frequency
Calibration instruments, standards
Generator, frequency
Thermometer, electronic, digital
Oscilloscope, multichannel
Converter, A/D
Oscilloscope, digital storage
Generator, signal
Oscilloscope, portable
Generator, function (pulse)
Datalogger
Analyzer, frequency (spectrum)
Line conditioner, UPS
IEEE-488 bus
Microprocessor design, test system
Analyzer, logic
Recorder, oscillographic
Power monitors
Analyzer, waveform
Analyzer, signal
IC test and measurement systems
Multiplexer
Amplifier, lock-in
Waveform recorder
Analyzer, pulse height
Camac systems, components
Use now%
Percent 0 10 20 30 40 50 60 70 80


Plan to acquire
Oscilloscope, digital storage
Printer-plotters
Converter, A/D
Line conditioner, UPS
Power supplies, dc high voltage
Calibration instruments, standards
Microprocessor design, test system
Voltmeter, digital
IEEE-488 bus
Multimeter, digital
Datalogger
Analyzer, frequency (spectrum)
Counter, time & frequency
Oscilloscope, analog
Thermometer, electronic, digital
Generator, frequency
Analyzer, waveform
Analyzer, logic
Oscilloscope, multichannel
Amplifier, lock-in
Generator, signal
IC test and measurement systems
Generator, function (pulse)
Oscilloscope, portable
Waveform recorder
Analyzer, signal
Multiplexer
Power monitors
Camac systems, components
Recorder, oscillographic
Analyzer, pulse height
Plan to acquire %
Percent 0 10 20 30 40

The growth rate in many instrument categories indicates that new users are entering the market.

spondents planning to acquire is divided by the number now using. This gives a rough guide to market potential by instrument type.

Thus the growth rate for the multichannel oscilloscope is 10.9% while that for the IEEE-488 bus is 36.8%.

Consistent data

This occasional study of the use of electrical and electronic instruments has been conducted by this magazine over a number of years, and the consistency of results from one study to the next gives a strong indication of the survey's validity.

For example, the percentages of responses as categorized by workplace shows this consistency:

	1983	1984	1988	1990
Industry	52.6	53.6	55.9	59.5
University	19.6	21.3	18.4	19.7
Non-profit Institution	7.4	6.1	3.0	2.4
Medical Research	2.6	3.3	2.1	1.4
Gov't	—	—	13.6	10.7
Other*	14.9	14.0	3.8	6.2

*Includes Gov't in '83, '84

Likewise, the percentages of geographical distribution once again mirror this magazine's total circulation by regions: Northeast 7.2, Middle Atlantic 17.2, E. North Central 19.6, W. North Central 7.2, S. Atlantic 10.3, E. South Central 4.8, W. South Central 6.5, Mountain 9.8, and Pacific 13.4.

Survey method

This Trendsurvey was conducted by including a prepaid card in a late September 1989 postcard mailing to *R&D Magazine* subscribers. Readers were asked specifically about the 31 instruments which are listed in this report.

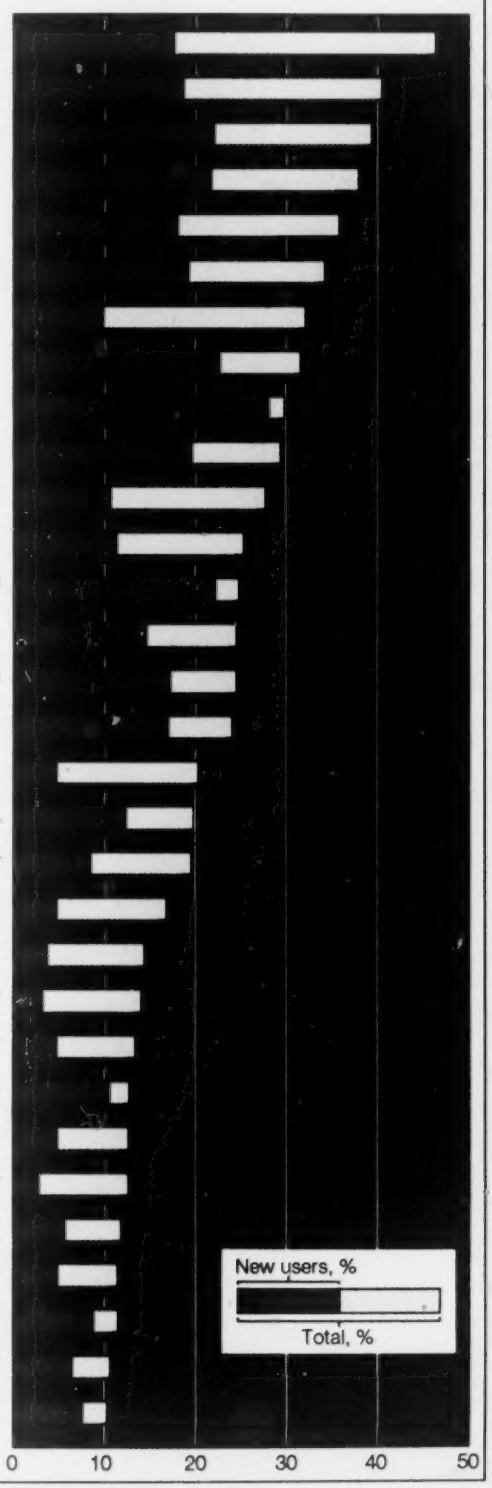
Most of the replies were received in the month following the October 13 stock market decline and, if anything, instrument purchase intentions may have been negatively biased by that event. **R&D**

READER RESPONSE PANEL

Please rate your interest in this article by circling the appropriate number on the Reader Service Card.

High **395** Medium **397** Low **399**

Growth rate: Plan to acquire/present use


Rank
Present 1988
Camac systems, components 1 —
Microprocessor design, test system 2 7
Oscilloscope, digital storage 3 5
Line conditioner, UPS 4 6
IEEE-488 bus 5 4
Amplifier, lock-in 6 13
Converter, A/D 7 —
IC test and measurement systems 8 1
Analyzer, waveform 9 10
Waveform (transient) recorder 10 3
Datalogger 11 2
Multiplexer 12 21
Analyzer, signal 13 20
Analyzer, frequency (spectrum) 14 14
Analyzer, pulse height 15 29
Analyzer, logic 16 11
Printer-plotters 17 9
Power monitors 18 —
Calibration instruments, standards 19 —
Power supplies, dc, high voltage 20 16
Counter, time & frequency 21 22
Voltmeter, digital 22 30
Multimeter, digital 23 18
Recorder, oscillographic 24 15
Thermometer, electronic, digital 25 12
Oscilloscope, analog 26 —
Generator, signal 27 23
Generator, frequency 28 24
Generator, function (pulse) 29 27
Oscilloscope, multichannel 30 25
Oscilloscope, portable 31 17
New users, %
Total, %
Percent 0 10 20 30 40 50

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Walker Scientific Inc.	231	340

*Domestic
†Foreign

R&D (ISSN 0746-9179), formerly *Research & Development*, is published monthly except semimonthly in February and November by The Cahners Publishing Company, A Division of Reed Publishing USA, 275 Washington St., Newton, MA 02158-1630. Terrence M. McDermott, President; Charles E. Moodhe, Senior Vice President/General Manager, Chicago Division; Jerry D. Neth, Senior Vice President/Publishing Operations; J.J. Walsh, SeniorVice President/-Finance; Thomas J. Dellamaria, Senior Vice President/Production and Manufacturing.; Ralph Knupp, Vice President/Human Resources; Timothy M. Kelly, Vice President and Publisher; Neil P. Ruzic, founder of *Industrial Research*.

Circulation records are maintained at Cahners Publishing Company, 44 Cook St., Denver, CO 80206-5800. Phone: 303/388-4511. **Circulation:** More than 120,000 copies distributed. Second-class postage paid at Denver, CO 80206-5800, and at additional mailing offices. **Postmaster:** Send address corrections to *R&D* at our Denver address.

Subscription rates for nonqualified people: USA, 1 yr $45, 2 yr $85; Canada and Mexico, 1 yr $55, 2 yr $100; all other countries, 1 yr $80, 2 yr $150; air mail surcharge, 1 yr $45, 2 yr $90. Except for special issues where price changes are indicated, single copies of regular issues are available for $10. Address all subscription mail to *R&D*, 44 Cook St., Denver, CO 80206-5800. Include zip code and, for change of address, copy of old label.

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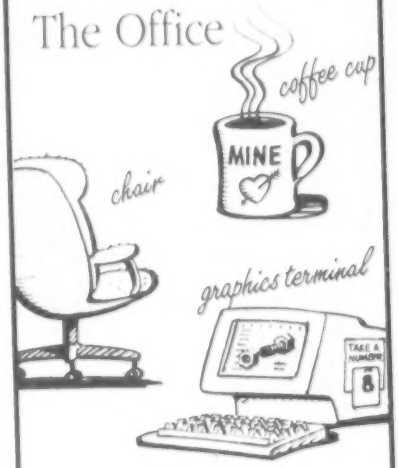
Three Things You Shouldn't Have To Share At The Office



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